CHAPTER 2

DESCRIPTION OF THE NONCONNAH CREEK WATERSHED

2.1 BACKGROUND.

The Nonconnah Creek watershed is heavily urbanized and supports very little recreational fishing, hunting, or boating. It contains areas of low gradient, murky streams with sand and silt bottoms that are mostly channelized. Smaller streams in the watershed have localized reaches of high gradient and small areas of gravel substrate that create aquatic habitats that are distinct from others in the area. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches.

This Chapter describes the location and characteristics of the Nonconnah Creek Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Tennessee portion of the Nonconnah Creek watershed is located in the western portion of the state and includes parts of Shelby and Fayette counties. The watershed extends into Mississippi.

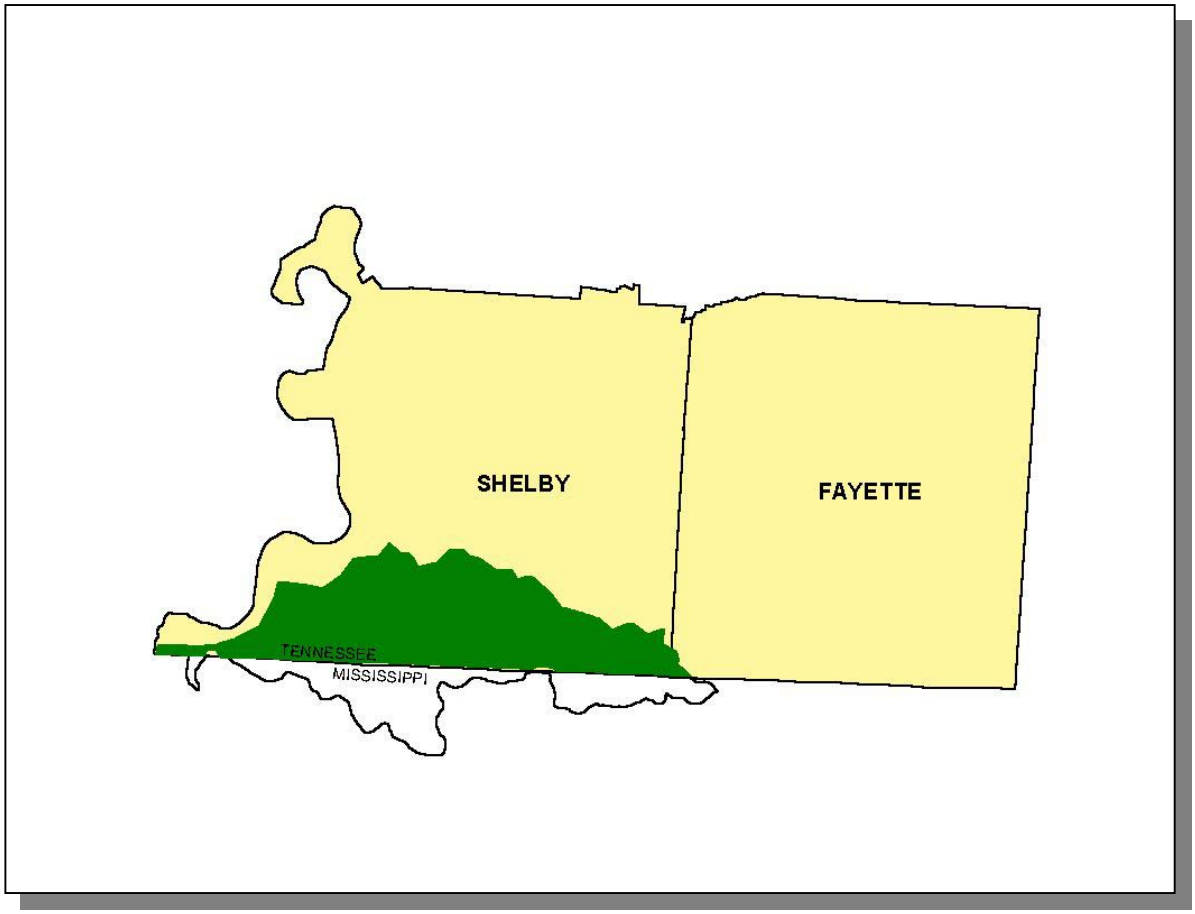

Figure 2-1. General Location of the Nonconnah Creek Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Shelby	99.4
Fayette	0.6

Table 2-1. The Nonconnah Creek Watershed Includes Parts of Two West Tennessee Counties. *An additional twenty-four percent of the watershed extends into Mississippi.*

2.2.B. Population Density Centers. Two interstates (I-40, I-55) and four state highways serve the major communities in the Nonconnah Creek Watershed.

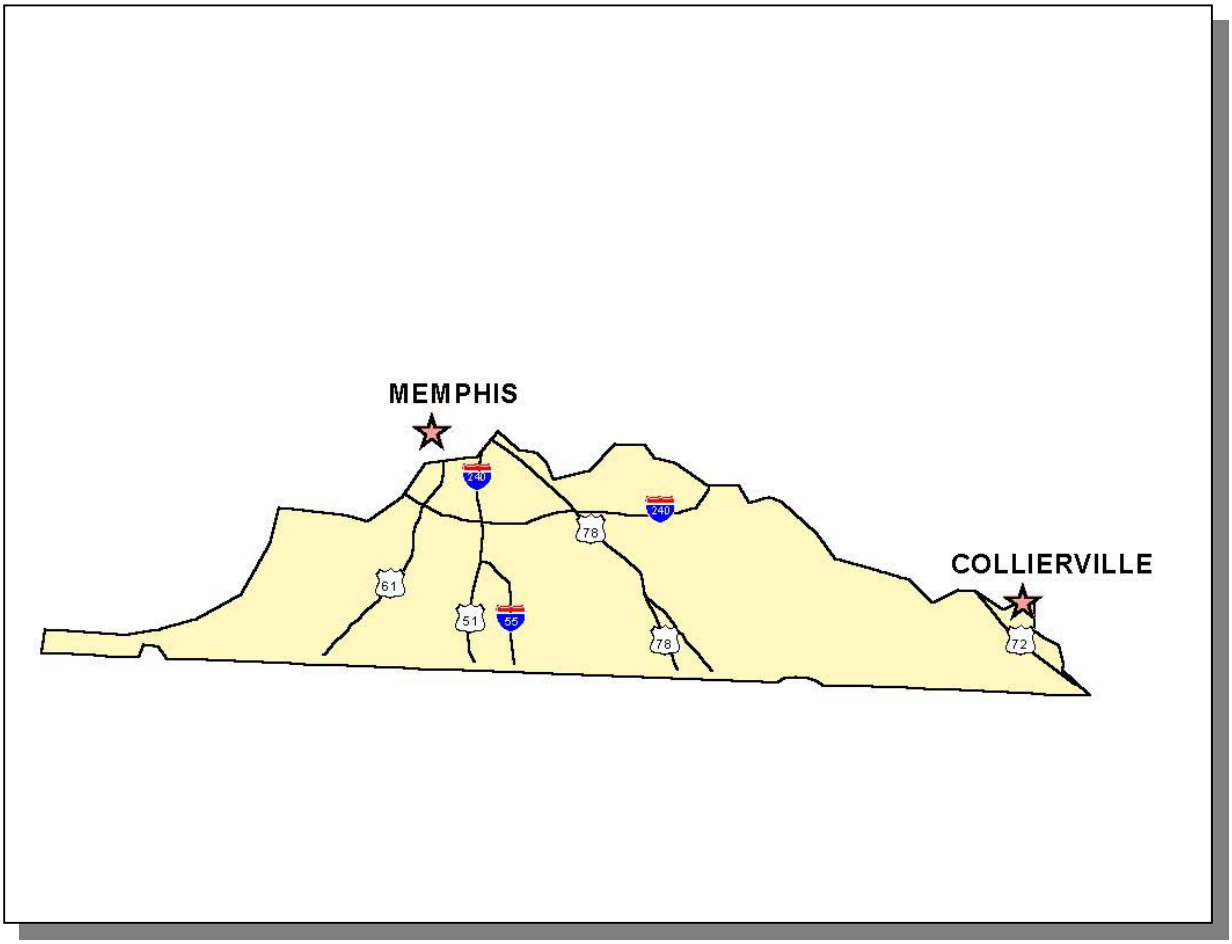

Figure 2-2. Municipalities and Roads in the Nonconnah Creek Watershed.

MUNICIPALITY	POPULATION	COUNTY
Memphis*	610,337	Shelby
Collierville	14,427	Shelby

Table 2-2. Municipalities in the Nonconnah Creek Watershed. *Population based on 1990 census (Tennessee Blue Book). Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Nonconnah Creek Watershed, designated the Hydrologic Unit Code 08010211 by the USGS, is approximately 281 square miles (184 square miles in Tennessee) and drains to the Mississippi River.

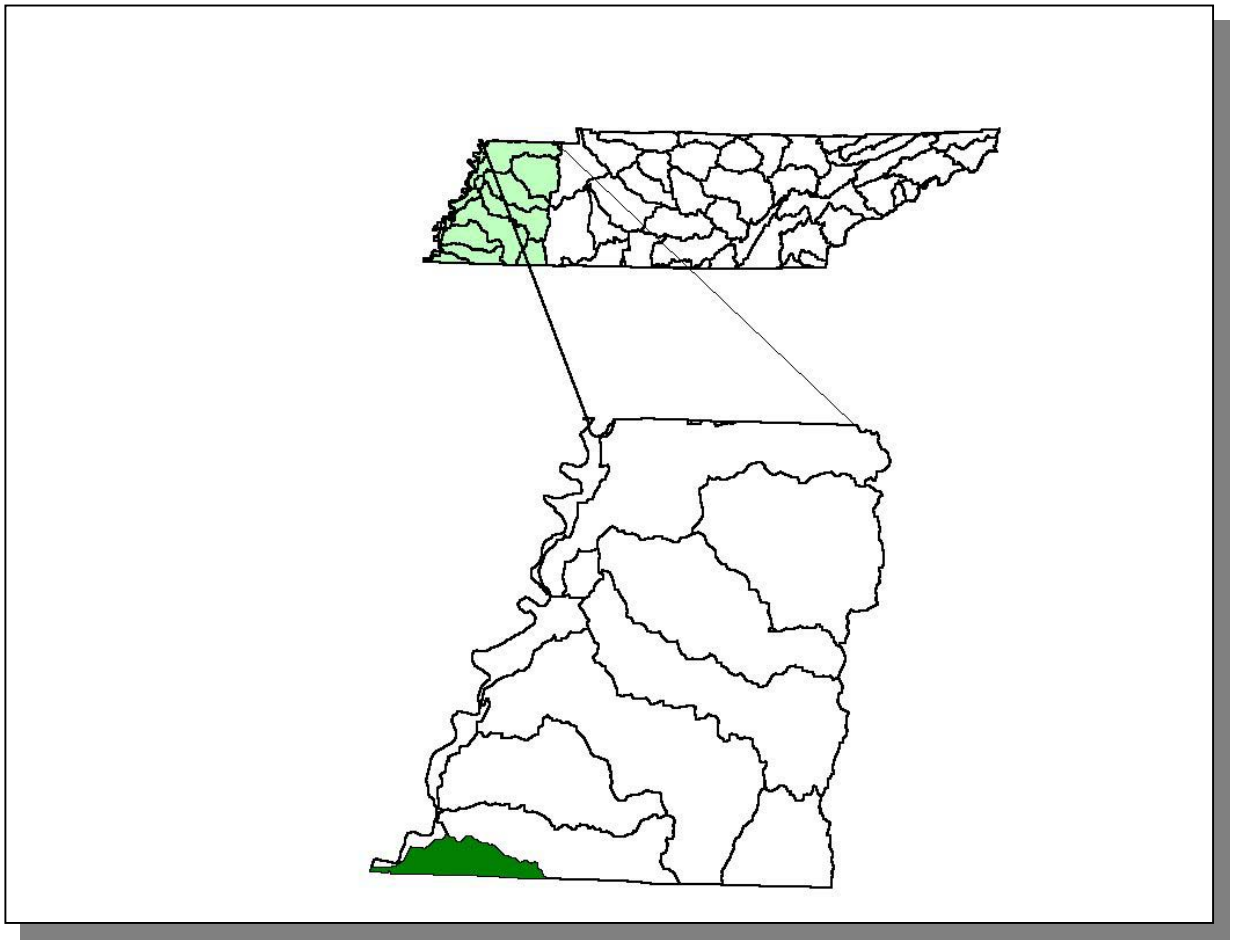

Figure 2-3. The Nonconnah Creek Watershed is part of the Mississippi River Basin.

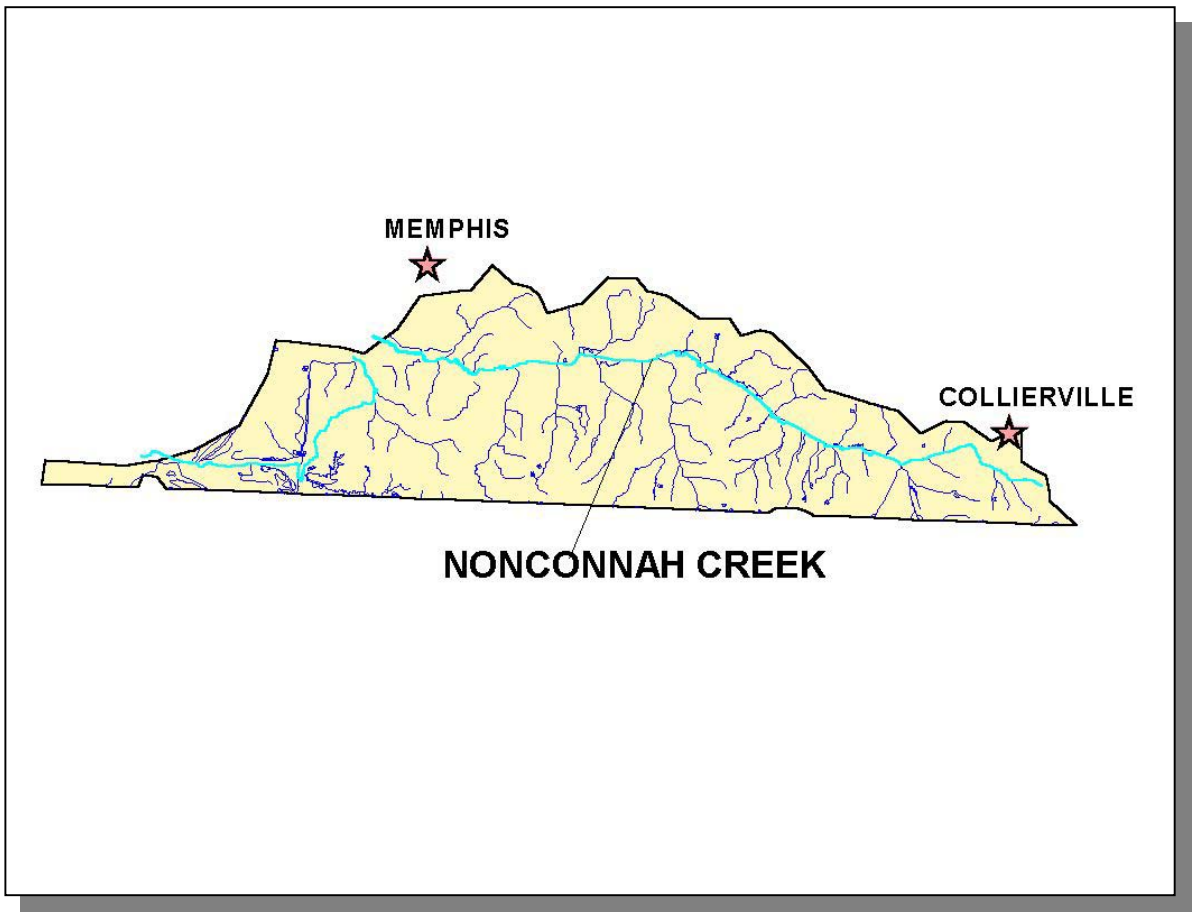

Figure 2-4. Hydrology in the Nonconnah Creek Watershed. *There are 257 stream miles recorded in River Reach File 3 in the Nonconnah Creek Watershed in Tennessee (382 total stream miles in Tennessee and Mississippi). Locations of Collierville and Memphis are shown for reference.*

2.3.B. Dams. There are 18 dams inventoried by TDEC Division of Water Supply in the Nonconnah Creek Watershed. These dams either retain at least 30 acre-feet of water or have structures at least 20 feet high. Additional dams may be found in the watershed.

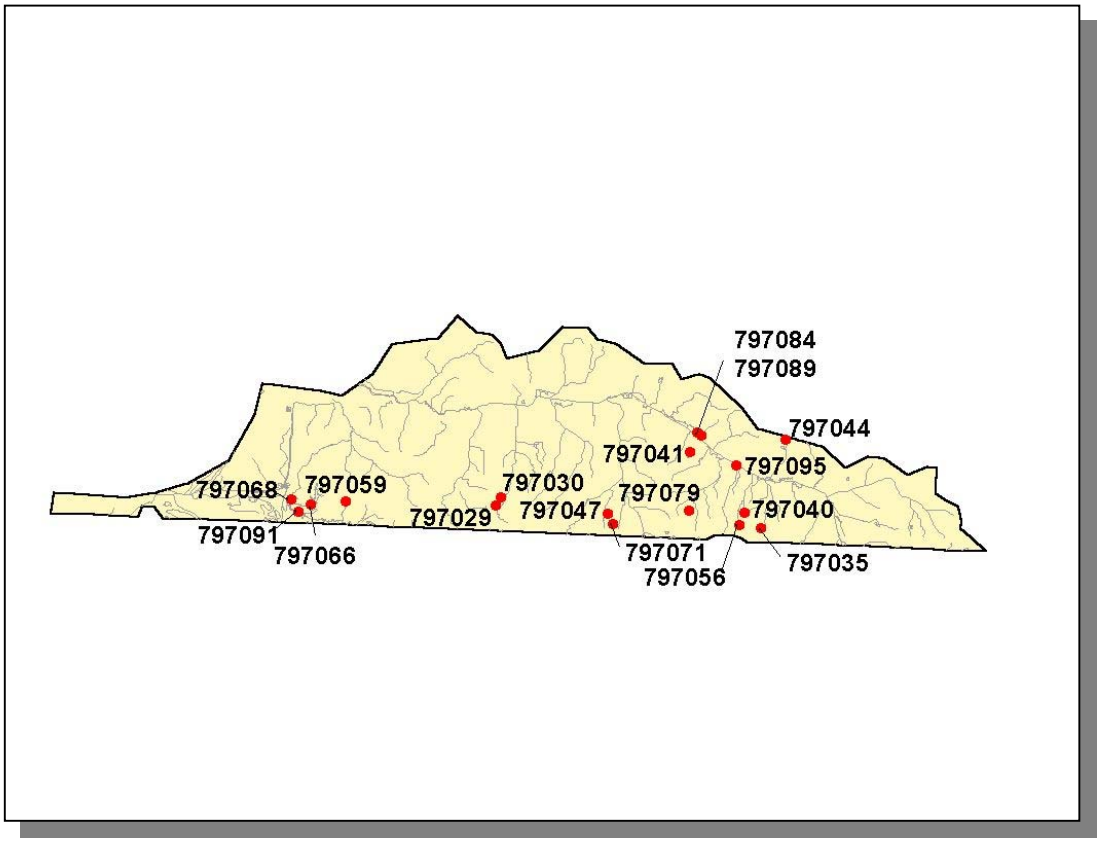

Figure 2-5. Location of Inventoried Dams in the Nonconnah Creek Watershed*. More information is provided in Nonconnah-Appendix II.*

2.4 LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

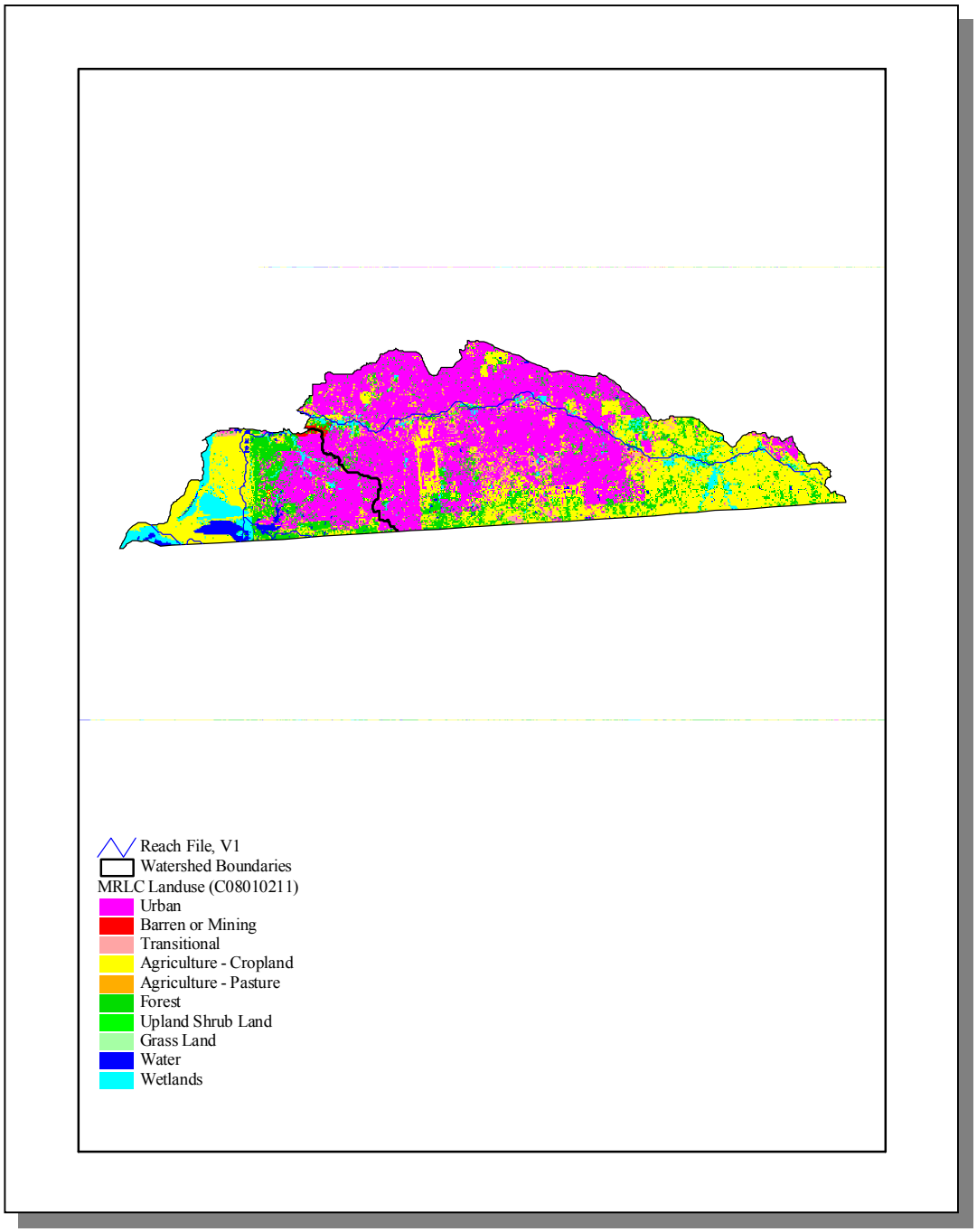

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

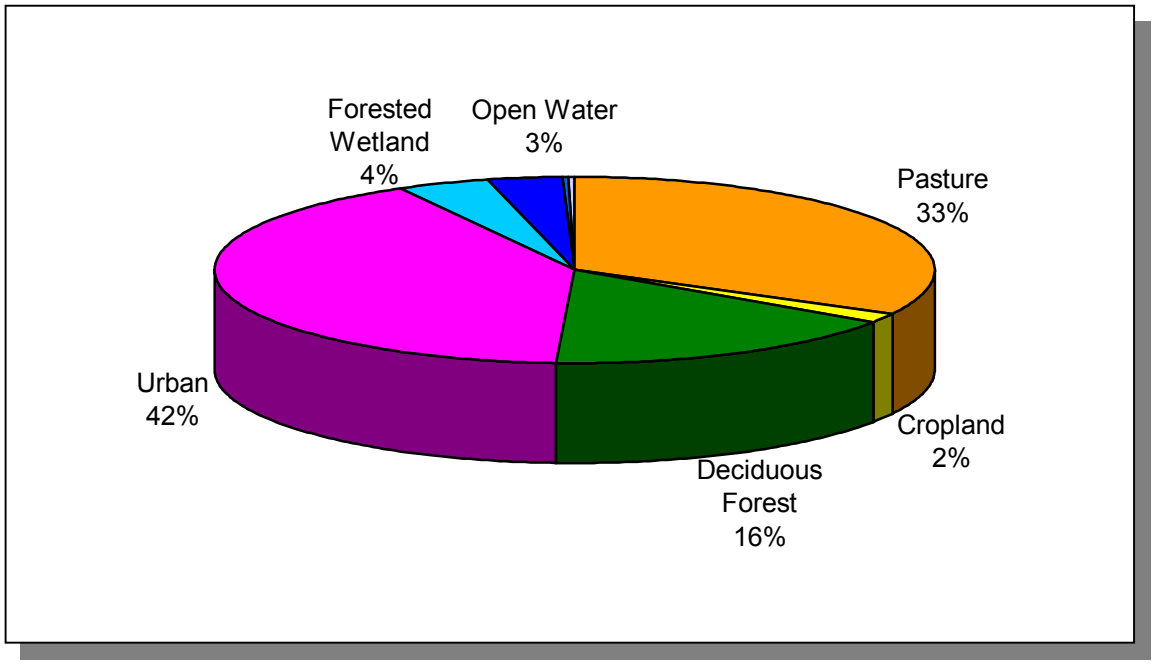

Figure 2-7. Land Use Distribution in the Nonconnah Creek Watershed. *More information is provided in Nonconnah-Appendix II.*

2.5 ECOREGIONS AND REFERENCE STREAMS Ecoregions are defined as relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies include the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Nonconnah Creek Watershed lies within 2 Level III ecoregions (Mississippi Alluvial Plain, Mississippi Valley Loess Plains) and contains 3 Level IV subecoregions (Griffen, Omernik, Azavedo, 1997):

- The Northern Mississippi Alluvial Plain (73a) within Tennessee is a relatively flat region of Quaternary alluvial deposits of sand, silt, clay, and gravel. It is bounded distinctly on the east by the Bluff Hills (74a), and on the west by the Mississippi River. Average elevations are 200-300 feet with little relief. Most of the region is in cropland, with some areas of deciduous forest. Soybeans, cotton, corn, sorghum, and vegetables are the main crops. The natural vegetation consists of Southern floodplain forest (oak, tupelo, bald cypress). The two main distinctions in the Tennessee portion of the ecoregion are

between areas of loamy, silty, and sandy soils with better drainage, and areas of more clayey soils of poor drainage that may contain wooded swamp-land and oxbow lakes. Waterfowl, raptors, and migratory songbirds are relatively abundant in the region.

- The Bluff Hills (74a) consist of sand, clay, silt, and lignite, and are capped by loess greater than 60 feet deep. The disjunct region in Tennessee encompasses those thick loess areas that are generally the steepest, most dissected, and forested. The carved loess has a mosaic of microenvironments, including dry slopes and ridges, moist slopes, ravines, bottomland areas, and small cypress swamps. While oak-hickory is the general forest type, some of the undisturbed bluff vegetation is rich in mesophytes, such as beech and sugar maple, with similarities to hardwood forests of eastern Tennessee. Smaller streams of the Bluff Hills have localized reaches of increased gradient and small areas of gravel substrate that create aquatic habitats that are distinct from those of the Loess Plains (74b) to the east. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches. Gravels are also exposed in places at the base of the bluffs.

- The Loess Plains (74b) are gently rolling, irregular plains, 250-500 feet in elevation, with loess up to 50 feet thick. The region is a productive agricultural area of soybeans, cotton, corn, milo, and sorghum crops, along with livestock and poultry. Soil erosion can be a problem on the steeper, upland Alfisol soils; bottom soils are mostly silty Entisols. Oak-hickory and southern floodplain forests are the natural vegetation types, although most of the forest cover has been removed for cropland. Some less-disturbed bottomland forest and cypress-gum swamp habitats still remain. Several large river systems with wide floodplains, the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf, cross the region. Streams are low-gradient and murky with silt and sand bottoms, and most have been channelized.

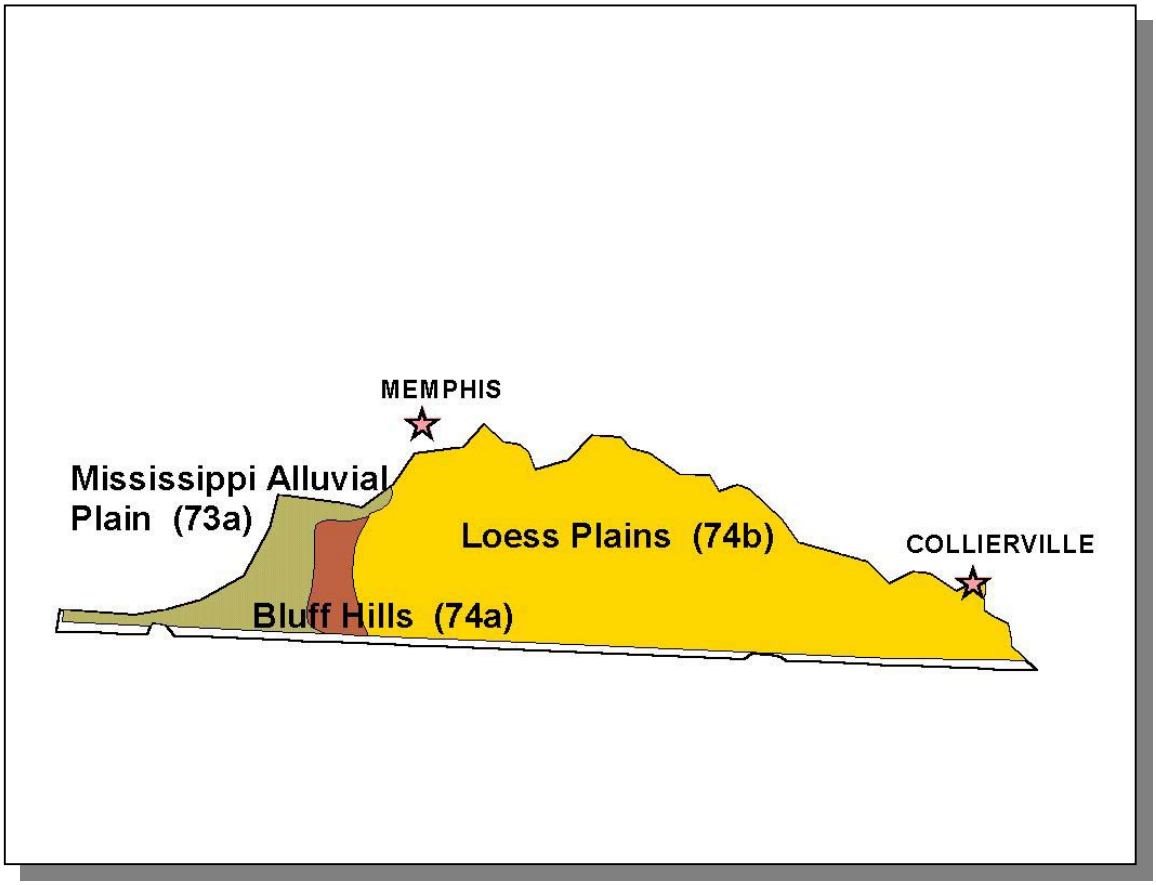

Figure 2-8. Level IV Ecoregions in the Nonconnah Creek Watershed. *Locations of Collierville and Memphis are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

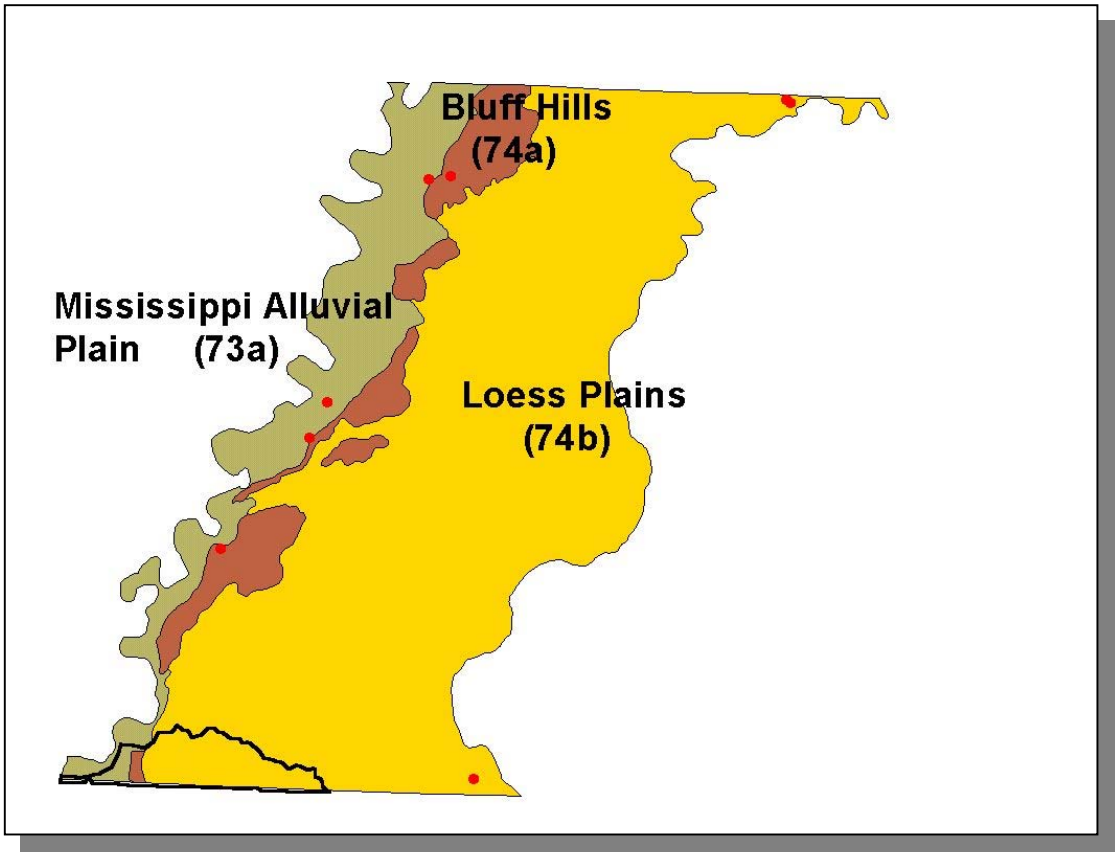

Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 73a, 74a, and 74b. *The Nonconnah Creek Watershed is shown for reference. More information is provided in Nonconnah-Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the Federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	0
Insects	0
Mussels	0
Snails	1
Amphibians	1
Birds	4
Fish	0
Mammals	0
Reptiles	0
Plants	1
Total	**7**

Table 2-3. There are 7 Documented Rare Plant and Animal Species in the Nonconnah Creek Watershed. Additional rare plant and animal species may be present.

Additionally, in the Nonconnah Creek Watershed, there is one rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Triodopsis multilineata	Striped whitelip		

Table 2-4. Rare Aquatic Species in the Nonconnah Creek Watershed.

2.6.B. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at http://www.state.tn.us/environment/epo/wetlands/strategy.zip.

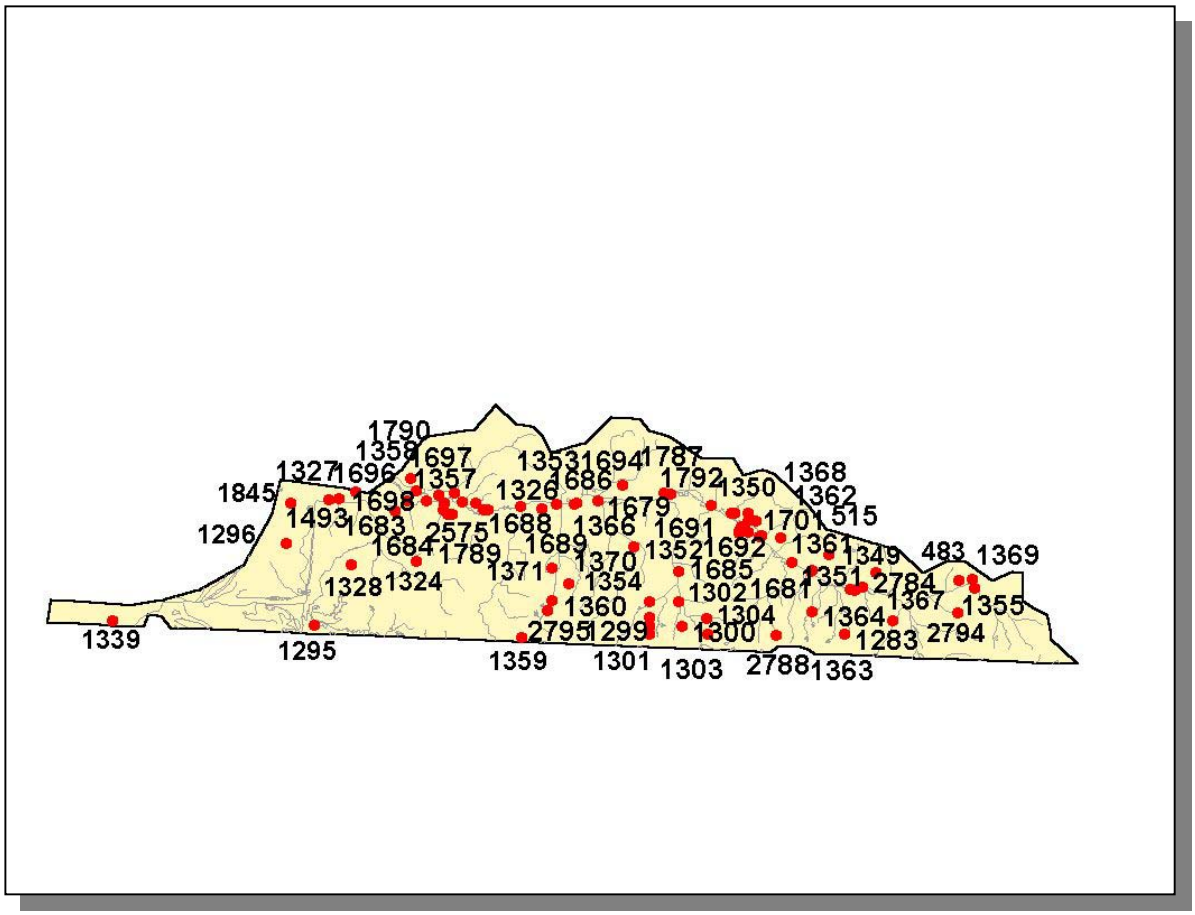

Figure 2-10. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Nonconnah Creek Watershed. ***There may be additional wetland sites in the watershed.*** *More information is provided in Nonconnah-Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- T. O. Fuller State Park, an 1100 acre park located 11 miles south of Memphis
- McKellar Park
- Oak Forest Memorial Gardens
- Pine Hills Park

In addition, many local interpretive areas are common, including Lichterman Nature Center and Audubon Park in Memphis.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/riv

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Cypress Creek	4			Johns Creek	4		2
Days Creek	4			Nonconnah Creek	4	3	2,4
Harbor Channel		1		Tenmile Creek	4		
Horn Lake Cutoff	4		2,4	Unnamed Tributary to Nonconnah Creek	3		
Hurricane Creek	4						

Table 2-5. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed as a fishery